SPECIFICATION

Model Name：R4B-500G1V2
Revision：1.1
Description：500W+500W Mini Redundant Power Supply.

Revision History

Rev.	Date	Revision Description	Modify By	Cust. Approval	App. Date
1.0	AUG.08 2011	Modified the circuit for DC-DC backplane	KEVIN		AUG.10, 2011
1.1	Dec.05 2011	1. Add the “push button reset switch” on P.12. 2. Modified the operation temp. to 50℃	Jacky		Dec.06, 2011

Prepared BY	Checked BY	Approved BY
	KEVIN	JACKY

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1. General Description

This specification describes the performance characteristics of a 500 watts hot swappable, 1+1 power system with +3.3V,+5V,+12V, -12V main DC outputs, and 5V standby outputs. The system is configured to hold two identical 500W power supply modules, ***SURE STAR*** Model R4B-500G1V2.

2. Input Characteristics

2.1. AC Input voltage and frequency

Minimum	Nominal	Maximum	Unit
90	100~240	264	VAC
47	50~60	63	Hz

2.2. Input current and inrush current

AC Input Voltage	MAX. Input Current per power supply module	Inrush Current per power supply module
115Vac	10A	25A
230Vac	5A	50A

2.3. Power Factor

90Vac	115Vac	230Vac	264Vac
＞0.99	＞0.98	＞0.95	＞0.92

3. Power Efficiency

The Minimum efficiency of the power supply is 80% at full load and 115Vac/60HZ input.

4. Output Characteristics

4.1. Output Voltage & Current Regulation

Output Voltage	Min. Current	Rated current	REGULATION
+3.3V	1A	25A	±5%
+5V	1A	25A	±5%
+12V	1A	41A	±5%
-12V	0A	0.8A	±5%
+5VSB	0.5A	3.5A	±5%

Note: The combined total power from 5V & 3.3V shall not exceed 170W.

4.2. DC Output Ripple & Noise

Output Voltage	Ripple & Noise (Max.)
+3.3V	60mVp-p
+5V	60mVp-p
+12V	120mVp-p
-12V	120mVp-p
+5VSB	50mVp-p

Note:

1. Ripple & Noise bandwidth is set to 20MHz.

2. Use a 0.1uF ceramic capacitor in parallel with a 10uF electrolytic capacitor at output connector terminals for ripple & noise measurements.

4.3. Hold Up Time

Output Voltage	115VAC Input	230VAC Input
+3.3V	＞16ms	＞16ms
+5V	＞16ms	＞16ms
+12V	＞16ms	＞16ms
-12V	＞16ms	＞16ms
+5VSB	＞16ms	＞16ms

Note: All of dc output at full load.。

4.4. Rise Time

Output Voltage	115/230Vac Input & Full Load
+3.3V	20ms (max.)
+5V	20ms (max.)
+12V	20ms (max.)
-12V	20ms (max.)
+5VSB	20ms (max.)

Note: The rise time measured is when the output voltages rise from10% to 90% of specified output voltage Vout observed on the channel waveform.

4.5. Dynamic load response time

The following shall apply to the 3.3 V, 5 V, and 12 V outputs:

Output voltage for each output shall recover to within 5 % of its steady state level in less than 1 ms under the following conditions:

AC Input Voltage: 90VAC ~ 264VAC			
Repetition rate of 100Hz with 50 % duty cycle			
Output	Step Load Size	Load Slew Rate	Capacitive Load
+3.3V	30% to 100% to 30% load	0.5 A/u sec	6000uF
+5V	30% to 100% to 30% load	0.5 A/u sec	6000uF
+12V	60% to 100% to 60% load	1 A/u sec	6000uf
+5SB	0% to 100% to 0% load	0.5 A/u sec	350uF

4.6. Remote on/off control

The main outputs of this power supply (3.3V,5V,12V,-12V) shall be energized when input signal*PSON is active. *PSON is an active low TTL compatible signal referenced to the +5V standby common. This input signal shall be an open collector signal capable of sinking a minimum of 1.6mA. When *PSON becomes inactive, the main outputs shall be disabled.

	PSU on	PSU off
PSON Signal	LOW (0.8V max)	HI (2V max)

5. Power good signal

The system shall have an active high TTL compatible signal capable of sinking 1mA and sourcing 100uA. The signal shall become active within 100 to 500 ms from the instant +5V output reaches a steady state level within the specified regulation limits. It shall become inactive at least 1 ms before +5V drops to below the lower regulation limit.

Power good @ 115/230VAC , Full Load	200ms ~ 500ms
Power Fail @ 115/230VAC , Full Load	1ms (Min.)

6. Protection

6.1. Over voltage protection

Output	Min	Max	Comments
+3.3V	3.75V	4.3V	PSU shutdown
+5V	5.7V	6.9V	PSU shutdown
+12V	13V	14.3V	PSU shutdown

Note：The power supply shall be test at max AC voltage (230Vac) and min load or no load.

6.2. Under-voltage protection

Output	Min	Max	Comments
+3.3V	2.0V	2.4V	PSU shutdown
+5V	3.3V	3.7V	PSU shutdown
+12V	8.5V	9.5V	PSU shutdown

Note：The power supply shall be test at max AC voltage (230Vac) and min load or no load.

6.3. Over current protection

Output	Over Current(Type)	Over Current(Max.)	Comments
+3.3V	≧27.5A	37.5A	PSU shutdown
+5V	≧27.5A	37.5A	PSU shutdown
+12V	≧45.1A	61.5A	PSU shutdown

Note：The over current protection should be tested at other load rating.

6.4. Short circuit protection

Output	Comments
+3.3V	PSU shutdown
+5V	PSU shutdown
+12V	PSU shutdown

Note：The Short circuit protection should be tested at other load rating.

6.5. Thermal Protection

The power supply shall go into thermal protection as the case temperature exceeds 86℃ （±5℃）limit. The output shall recover only when the temperature becomes normal and AC power is turned on again.

7. Power System Signal status

7.1. Buzzer status

Power Supply Condition	Buzzer status
No AC power to all PSU	OFF
AC present/Only Standby Output On	OFF
Power supply DC outputs ON and OK	OFF
Power supply failure	Beeping

7.2. LED indicators

Power Supply Condition	Power system status		Per Power Module status
LED Color	RED	GREEN	ORANGE
No AC power to all PSU	OFF	OFF	OFF
AC present/Only Standby Output On	ON	OFF	OFF
Power supply DC outputs ON and OK	OFF	ON	ON
Power supply failure	OFF	Blinking	OFF

7.3. TTL signal

POWER SUPPLY CONDITION	OUTPUT CONDITION	
	Min.	Max.
NORMAL(POWER SUPPLY ON)	3V	5.25V
FAILURE(POWER SUPPLY OFF)	0V	1V

8. Load sharing

Output Voltage	Load Current	Load Share Voltage
+12V	1A	+0.48V ~ +0.52V
+5V	1A	+0.33V ~ +0.37V
+3.3V	1A	+0.33V ~ +0.37V

9. Isolation

9.1. Insulation Resistance

Input To Output	500Vdc , 50M ohms Min.(at room Temperature)
Input To FG	500Vdc , 50M ohms Min.(at room Temperature)
Output To FG	Non Insulation

9.2. Dielectric Withstand Voltage

Input To Output	1834Vac (30 mA) for 1 Minute.
Input To FG	1834Vac (30 mA) for 1 Minute.
Output To FG	Non Insulation

9.3. Leakage current

3.5mA max. at 120~264Vac/50~60HZ.

10. **Safety** Requirements

-IEC 60950-1

-TUV EN 60950-1

-UL or cUL

-BSMI

-CCC

11. EMC

The power supply shall comply with the following criterion:

11.1. EMI

1) Conduction Emission:

A.EN55022:2006/A1:2007 CLASS A; EN55024:1998/A1:2001/A2:20003.

B.CISPR PUB.22 and FCC PART 15 SUBPART B CLASS A.

2) Radiated Emission :

A.EN55022:2006/A1:2007 CLASS A; EN55024:1998/A1:2001/A2:20003.

B.CISPR PUB.22 and FCC PART 15 SUBPART B CLASS A.

12. Environmental

12.1. Temperature

Operating : 0℃to +50℃

Non Operating: -20℃to +70℃

12.2. Humidity

Operating : 5% to 95%, non-condensing

Non Operating: 20% to 90%,non-condensing

12.3. Altitude

Operating: sea level to 7,000 feet

Non-operating: sea level to 40,000 feet

12.4. Vibration

10-55Hz, 19.6m/s²(2G), 3minutes period, 60minutes each along X, Y and Z axis.

12.5. Shock

49m/s²(5G),11ms, once each X, Y and Z axis.

12.6. Cooling Method

BY BALL BEARING DC FAN.

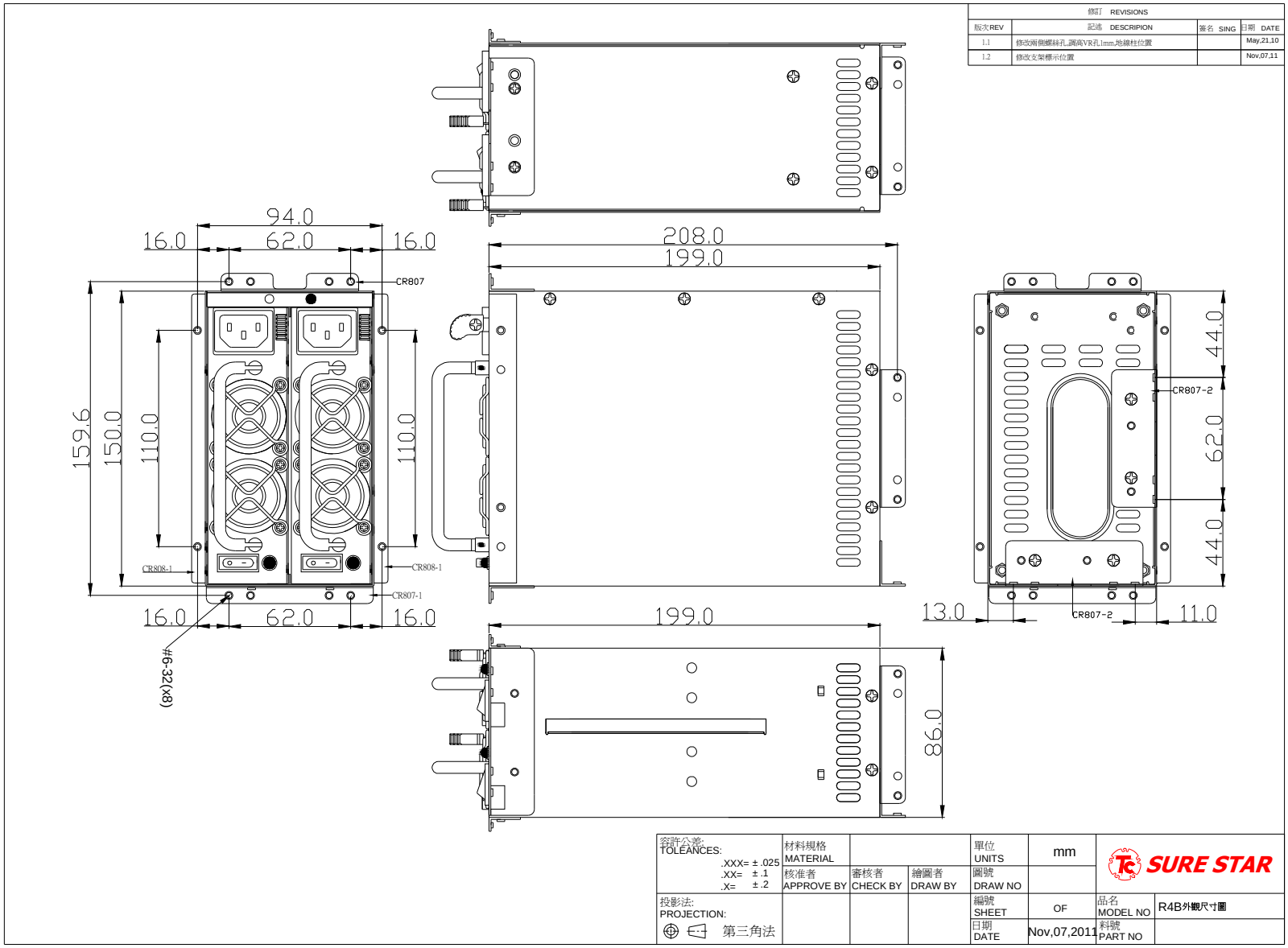
13. Reliability

13.1 MTBF Qualification

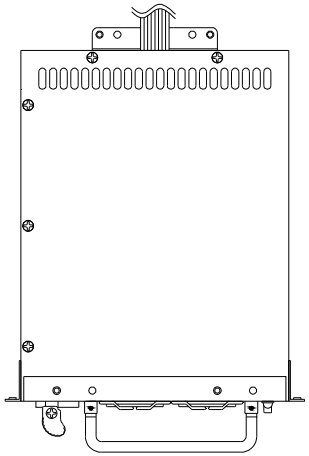
Using MIL - HDBK -217F the calculated MTBF＞100,000 hours at 25℃

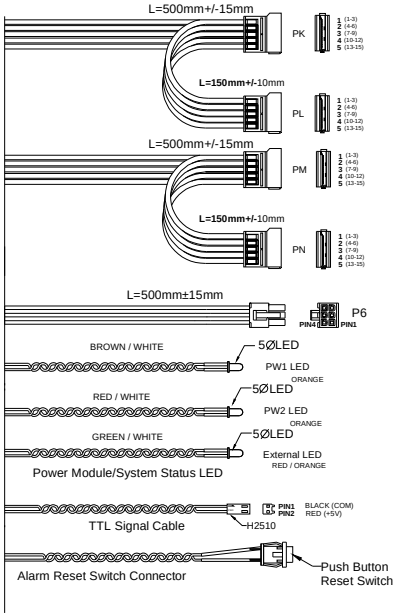
14. Mechanical 2D Drawing and Power Connector

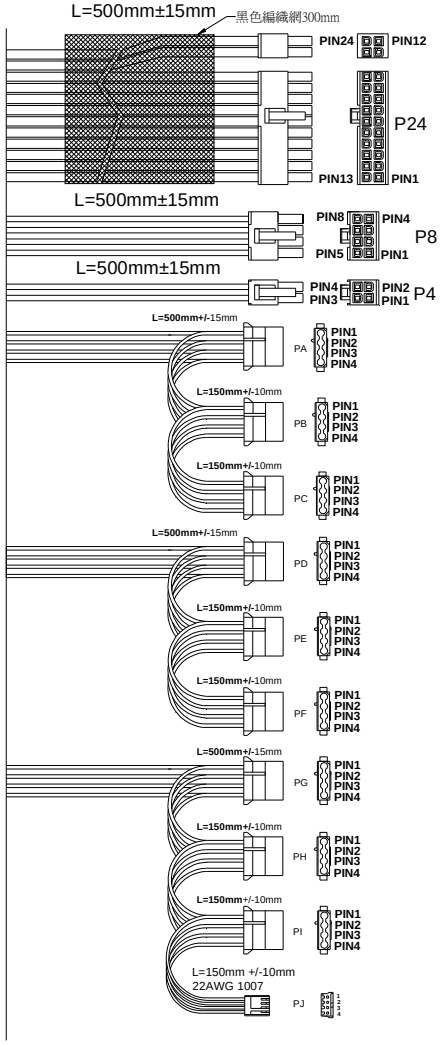
14.1. Outside Dimension:199(D)x150(W)x86(H)mm



14.2. DC Output cables







REVISIONS			
REV	DESCRIPTION	SIGN	DATE
01	Alarm Reset Switch Connector+Micro Switch		Dec.01.2011

24Pins(EPS12V)
Connector HOUSING: MOLEX 39-01-2240 or equivalent
TERMINAL: MOLEX 39-00-0039 or equivalent

Housing	Pin No.	WIRE COLOR	LENGTH	Pin No.	WIRE COLOR	LENGTH
P24	1	ORANGE(+3.3V)	500mm/18AWG	13	ORANGE(+3.3V) ORANGE(+3.3V)	500mm/18AWG 500mm/22AWG
	2	ORANGE(+3.3V)	500mm/18AWG	14	BLUE(-12V)	500mm/18AWG
	3	BLACK(GND)	500mm/18AWG	15	BLACK(GND)	500mm/18AWG
	4	RED(+5V)	500mm/18AWG	16	GREEN(PS-ON)	500mm/22AWG
	5	BLACK(GND)	500mm/18AWG	17	BLACK(GND)	500mm/18AWG
	6	RED(+5V)	500mm/18AWG	18	BLACK(GND)	500mm/18AWG
	7	BLACK(GND)	500mm/18AWG	19	BLACK(GND)	500mm/18AWG
	8	GRAY(PG)	500mm/22AWG	20	NC	
	9	PURPLE(+5VSB)	500mm/18AWG	21	RED(+5V)	500mm/18AWG
	10	YELLOW(+12V)	500mm/18AWG	22	RED(+5V)	500mm/18AWG
	11	YELLOW(+12V)	500mm/18AWG	23	RED(+5V)	500mm/18AWG
	12	ORANGE(+3.3V)	500mm/18AWG	24	BLACK(GND)	500mm/18AWG

8Pins(EPS12V)
Connector HOUSING: MOLEX 39-01-0280 or equivalent
TERMINAL: MOLEX 39-00-0060 or equivalent

Housing	Pin No.	WIRE COLOR	SIGNAL	WIRE TYPE	LENGTH
P8	1	BLACK	COM	18AWG	500mm ±15mm
	2	BLACK	COM	18AWG	
	3	BLACK	COM	18AWG	
	4	BLACK	COM	18AWG	
	5	YELLOW	+12V	18AWG	
	6	YELLOW	+12V	18AWG	
	7	YELLOW	+12V	18AWG	
	8	YELLOW	+12V	18AWG	

4Pins(ATX12V_FOR P4)
Connector HOUSING: MOLEX 39-01-0280 or equivalent
TERMINAL: MOLEX 39-00-0060 or equivalent

Housing	Pin No.	WIRE COLOR	SIGNAL	WIRE TYPE	LENGTH
P4	1	BLACK	COM	18AWG	500mm ±15mm
	2	BLACK	COM	18AWG	
	3	YELLOW	+12V	18AWG	
	4	YELLOW	+12V	18AWG	

4Pins(HD/CD-ROM/RW):P4H1~P4H4
Connector HOUSING: AMP 480424-0 or equivalent
TERMINAL:AMP 60619-4 or equivalent
4Pins(FLOPPY DISK):P4F
Connector HOUSING: AMP 171822-4 or equivalent
TERMINAL: AMP 170262-2 or equivalent

Housing	Pin No.	WIRE COLOR	SIGNAL	WIRE SIZE	LENGTH
PA PD PG	1	YELLOW	+12V	18AWG	500mm ±15mm
	2	BLACK	COM	18AWG	
	3	BLACK	COM	18AWG	
	4	RED	+5V	18AWG	
PB PE PH	1	YELLOW	+12V	18AWG	150mm ±15mm
	2	BLACK	COM	18AWG	
	3	BLACK	COM	18AWG	
	4	RED	+5V	18AWG	
PC PF PI	1	YELLOW	+12V	18AWG	150mm ±15mm
	2	BLACK	COM	18AWG	
	3	BLACK	COM	18AWG	
	4	RED	+5V	18AWG	
PJ	1	YELLOW	+12V	22AWG	150mm ±15mm
	2	BLACK	COM	22AWG	
	3	BLACK	COM	22AWG	
	4	RED	+5V	22AWG	

S.ATA HDD
HOUSING: MOLEX 675820000 or equivalent
TERMINAL: MOLEX 675810000 or equivalent

Housing	Pin No.	WIRE COLOR	SIGNAL	WIRE TYPE	LENGTH
PK PM	1	ORANGE	+3V3	18AWG	500mm ±15mm
	2	BLACK	COM	18AWG	
	3	RED	+5V	18AWG	
	4	BLACK	COM	18AWG	
	5	YELLOW	+12V	18AWG	
Housing	Pin No.	WIRE COLOR	SIGNAL	WIRE TYPE	LENGTH
PL PN	1	ORANGE	+3V3	18AWG	150mm ±15mm
	2	BLACK	COM	18AWG	
	3	RED	+5V	18AWG	
	4	BLACK	COM	18AWG	
	5	YELLOW	+12V	18AWG	

6Pins(PCI Express)
Connector HOUSING: MOLEX 39-01-0280 or equivalent
TERMINAL: MOLEX 39-00-0060 or equivalent

Housing	Pin No.	WIRE COLOR	SIGNAL	WIRE TYPE	LENGTH
P6	1	YELLOW	+12V	18AWG	500mm ±15mm
	2	YELLOW	+12V	18AWG	
	3	YELLOW	+12V	18AWG	
	4	BLACK	COM	18AWG	
	5	BLACK	COM	18AWG	
	6	BLACK	COM	18AWG	

POWER Module/System Status LED

Name	WIRE COLOR		LED COLOR	WIRE TYPE	LENGTH
PW1LED	BROWN	WHITE	ORANGE	22AWG	900mm ±20mm
PW2LED	RED	WHITE	ORANGE	22AWG	
External LED	GREEN	WHITE	RED/ORANGE	22AWG	

TTL Signal
Connector HOUSING: Molex 22-01-3027 or equivalent

Pin No.	WIRE COLOR	SIGNAL	WIRE TYPE	LENGTH
1	BLACK	COM	22AWG	900mm ±20mm
2	RED	+5V	22AWG	

ALARM Reset Switch Connector+Push Button Reset Switch

Pin No.	WIRE COLOR	SIGNAL	WIRE TYPE	LENGTH
1	GRAY	COM	22AWG	900mm ±20mm
2	GRAY	REST	22AWG	

TOLERANCES: XXX± XX± X±	MATERIAL		UNITS	mm	SURE STAR	
PROJECTION:	APPROVE BY	CHECK BY	DRAW BY JACKY	SHEET	MODEL NO.	ES-R4B(B※)
				DATE Dec.06.2011	PART NO.	